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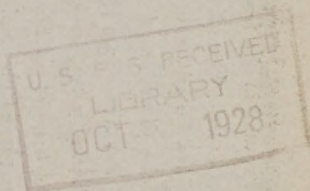
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FOREST PRODUCTS RESEARCH IN PICTURES

NO. 49

**SWERVING FIBERS
WEAKEN LUMBER**



**FOREST PRODUCTS LABORATORY
U. S. FOREST SERVICE
MADISON, WISCONSIN**

Wood fibers sometimes take a spiral course in the tree instead of their normal course straight up the trunk. This peculiarity is called spiral grain. The effect is that the grain in lumber cut from the tree does not parallel the board edges. In a board having spiral grain the true direction of the fibers, indicated in the board shown here by the direction of the season checks, can not be judged from the direction taken by the dark annual ring lines on a plain-sawed surface. Spiral grain can be detected by noting the direction of season checks, pores, or resin ducts, by picking up and tearing out fibers with a knife, by applying ink along a group of fibers on a plain-sawed surface with a fine pointed pen, or by noting the dip of fibers in places chipped out by the planer on a quarter-sawed surface.

Spiral grain reduces the strength of boards or timbers considerably if the slope is great and it tends to produce twisting in boards, dimension stock and timbers in seasoning. The amount of slope is measured by the distance required for a given line of fibers to diverge one inch from a line parallel to the main axis, and it is expressed as "1 in 20," "1 in 15," or whatever the degree of slope may be.

The property of timber most affected by spiral grain is resistance to shocks or impact loads, this resistance being considerably lowered by slopes of as little as 1 in 25. Compressive strength, or resistance to crushing, is the strength characteristic least affected. For highly stressed wooden members a slope greater than 1 in 20 is not safe. The basic grading rules for structural timbers issued by the Forest Products Laboratory limit slope of grain for the basic grade to 1 in 15.

The cause of spiral grain is not known. Experiments are being conducted both in this country and in India to find out if it is hereditary, and whether there is a possible means of avoiding the production of spiral-grained trees in the forest.

Photographs by U. S. Forest Service



